In the claims:

1. (previously presented) A method for determining the thickness of material by penetrating the material, in particular a method for measuring the thickness of walls, ceilings and floors, with which a measurement signal (28) in the gigahertz frequency range emitted using a single high-frequency transmitter (24) penetrates the material (10) to be investigated at least once and is detected by a single high-frequency receiver (38),

wherein the thickness (d) of the material (10) is measured via at least two transit-time measurements of the measurement signal performed for various positions (20, 22) of the single high-frequency transmitter (24) and the single high-frequency receiver (34) operated in a same hand-held device.

2. (original) The method as recited in Claim 1, wherein the high-frequency transmitter (24) and the high-frequency receiver (38) are operated on a first surface (14) of the material (10), and the measurement signal (28) from the high-frequency transmitter (24) is reflected back to the high-frequency receiver (38) by a reflector means (18).

3. (original) The method as recited in Claim 2, wherein, the reflector means (18) includes a transponder (40,140, 240, 340).

Claim 4 cancelled.

5. (previously presented) The method as recited in Claim 41, wherein the measuring device (12) is moved over a surface (14) of the material to record the at least two transit-time measurements.

6. (original) The method as recited in Claim 5, wherein, the displacement path (s) of the measuring device (12) is detected.

7. (original) The method as recited in Claim 1, wherein the measurement signal (28) is generated in the gigahertz frequency range using a pulsed-radar method and is launched into the material (10).

8. (previously presented) The method as recited in Claim 1, wherein one or more measurement frequency/frequencies (28) are used in an interval of 1000 MHz to 5000 MHz, and preferably in an interval of 1500 MHz to 3500 MHz.

9. (previously presented) A device system for carrying out the method as recited in Claim 1, wherein the device includes at least one high-frequency measuring device (12) capable of being placed on a surface (14) of a material (10), with at least one high-frequency transmitter (24) and a high-frequency receiver (38), and a transponder (40, 140, 240, 340) capable of being moved relative to this high-frequency measuring device.

10. (previously presented) The system as recited in Claim 9, wherein the at least one high-frequency measuring device (12) includes a position-detection system (50, 52) for recording a path (s).

11. (previously presented) A method for determining the thickness of material by penetrating the material, in particular a method for measuring the thickness of walls, ceilings and floors, with which a measurement signal (28) in the gigahertz frequency range emitted using a single high-frequency transmitter (24) penetrates the material (10) to be investigated at least once and is detected by a single high-frequency receiver (38), wherein the thickness (d) of the material (10) is measured via at least two transit-time measurements of the measurement signal performed for various positions (20, 22) of the single high-frequency transmitter (24) and the single high-frequency receiver (34), wherein the single high-frequency transmitter (24) and the single high-frequency receiver (38) are operated on a first surface (14) of the material (10), and the measurement signal (28) from the single high-frequency transmitter (24) is reflected back to the single high-frequency receiver (38) by a transponder (18) located on a second surface (16) of the material (10).

12. (new) A method for determining the thickness of material by penetrating the material, in particular a method for measuring the thickness of walls, ceilings and floors, with which a measurement signal (28) in the gigahertz frequency range emitted using a single high-frequency transmitter (24)

penetrates the material (10) to be investigated at least once and is detected by a single high-frequency receiver (38),

wherein the thickness (d) of the material (10) is measured via at least two transit-time measurements of the measurement signal performed for various positions (20, 22) of the single high-frequency transmitter (24) and the single high-frequency receiver (34) operated in a same hand-held device; and

wherein the high-frequency transmitter (24) and the high-frequency receiver (38) are operated on a first surface (14) of the material (10), and the measurement signal (28) from the high-frequency transmitter (24) is reflected back to the high-frequency receiver (38) by a reflector means (18).